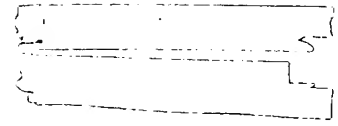


1. A direction sensor comprising:
 - a substrate;
 - 5 a first detecting circuit formed on a main surface of the substrate and including at least two detecting elements;
 - a second detecting circuit formed on the main surface of the substrate and including at least two detecting elements;
 - a first magnetic bias application part disposed facing toward the first
 - 10 detecting circuit; and
 - a second magnetic bias application part disposed facing toward the second detecting circuit, and producing a magnetic field in a direction different from that of a magnetic field the first magnetic bias application part produces.
- 15 2. The direction sensor according to claim 1, wherein each of the first and the second magnetic bias application parts is composed of a permanent magnet.
3. The direction sensor according to claim 1, further comprising an insulating layer covering at least one of the first detecting circuit and the second detecting
- 20 circuit.
4. The direction sensor according to claim 1,
 - wherein the first detecting circuit includes:
 - a first detecting element;
 - 25 a second detecting element of which a longitudinal pattern direction is different from that of the first detecting element, and which is electrically connected to the first detecting element in series;
 - a third detecting element of which a longitudinal pattern direction is



in parallel with that of the second detecting element; and

a fourth detecting element of which a longitudinal pattern direction is in parallel with that of the first detecting circuit, and which is electrically connected to the third detecting element in series,

5 in which the first detecting element and the second detecting element are electrically connected in parallel, and the third detecting element and the fourth detecting element are also electrically connected in parallel,

wherein the second detecting circuit includes:

a fifth detecting element;

10 a sixth detecting element of which a longitudinal pattern direction is different from that of the fifth detecting element, and which is electrically connected to the fifth detecting element in series;

a seventh detecting element of which a longitudinal pattern direction is in parallel with that of the sixth detecting element; and

15 an eighth detecting element of which a longitudinal pattern direction is in parallel with that of the fifth detecting element, and which is electrically connected to the seventh detecting circuit in series, and

in which the fifth detecting element and the sixth detecting element are electrically connected in parallel, the seventh detecting element and the
20 eighth detecting element are also electrically connected in parallel.

5. The direction sensor according to claim 4,

wherein a direction of a magnetic field produced by the first magnetic bias application part and a direction of a magnetic field produced by the second
25 magnetic bias application part are crossing at 90°,

wherein the longitudinal pattern direction of the first detecting element and the longitudinal pattern direction of the second detecting element are crossing at 90°,



wherein the longitudinal pattern direction of the fifth detecting element and the longitudinal pattern direction of the seventh detecting element are crossing at 90°.

5 6. The direction sensor according to claim 5,

wherein the direction of the magnetic field produced by the first magnetic bias application part and the longitudinal pattern direction of the first detecting element are crossing at 45°,

10 wherein the direction of the magnetic field produced by the second magnetic bias application part and the longitudinal pattern direction of the fifth detecting element are crossing at 45°.

7. The direction sensor according to claim 1,

wherein the first detecting circuit includes:

15 a first detecting element; and

a second detecting element of which a longitudinal pattern direction is different from that of the first detecting element, and which is electrically connected to first detecting element in series,

wherein the second detecting circuit includes:

20 a third detecting element; and

a fourth detecting element of which a longitudinal pattern direction is different from that of the third detecting element, and which is electrically connected to the third detecting element in series.

25 8. The direction sensor according to claim 1,

wherein the first and the second magnetic bias application parts are composed of one of CoPt alloy and ferrite.

9. The direction sensor according to claim 1,

wherein the insulating layer is composed of SiO_2 .

10. The direction sensor according to claim 1,

5 wherein a magnetic field strength generated by the first and second magnetic bias application parts are 5 Oe at least and 20 Oe at most.

11. The direction sensor according to claim 1, further comprising:

10 a surrounding magnetic bias application part surrounding at least one of the first detecting circuit and the second detecting circuit.

12. The direction sensor according to claim 1,

wherein the first detecting circuit and the second detecting circuit are formed on different main surfaces of the substrate.

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13. The direction sensor according to claim 1,

wherein the substrate has a glass glaze layer formed on the main surface of the substrate.

20 14. A production method of a direction sensor comprising:

(1) forming a first detecting circuit and a second detecting circuit on a main surface of a substrate; and

25 (2) forming a first magnetic bias application part facing toward the first detecting circuit, and forming a second magnetic application part facing toward the second detecting circuit,

wherein a direction of a magnetic field produced by the first magnetic bias application part and a direction of a magnetic field produced by the second magnetic bias application part are different with each other.

15. The production method of the direction sensor according to claim 14 further comprising:

5 forming an insulating layer covering at least one of the first detecting circuit and the second detecting circuit.

16. The production method of the direction sensor according to claim 15, wherein the process (2) includes:

10 disposing a resist on the insulating layer in an area where the first and the second magnetic bias application parts are not to be formed;

 applying a magnet material forming the first and the second magnetic bias application parts onto an entire area of the insulating layer;
and,

15 removing the resist.

17. The production method of the direction sensor according to claim 14, further including:

20 directing the magnetic field of the first and the second magnetic bias application parts.